GAO

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Working Comfortably With Video Display Terminals

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Introduction

Public interest in the safety and health issues associated with the use of video display terminals (VDTs) is increasing. As the use of computers throughout GAO grows, so will staff inquiries about their impact on personal health. The concerns of most VDT users relate to eyesight, physical or muscular side effects, and radiation effects.

No evidence exists to suggest that adverse health effects result from low-level radiation emitted by VDTs, but the issue remains controversial. Most computers emit both very low frequency (VFL) and extremely low frequency (ELF) electromagnetic fields. According to NIOSH, all forms of radiation emitted by VDTs are well below levels considered hazardous. Tests have shown ELF emission from VDTs to be well below that emitted by hair dryers, irons, and other household appliances. An extensive recent study conducted by NIOSH has shown that no risks from VLF emissions were associated with pregnant women whose jobs required them to spend long hours in front of computers.

Much of the information in this brochure comes from standard office practice guidelines for tasks requiring long periods of concentration and repetitive motions. These suggestions will help users avoid fatigue and discomfort and tell them how to best use the computer to make tasks easier and more enjoyable.

Visual Discomfort

Eye fatigue is commonly reported by those who spend long periods in front of VDTs. Computer operators complain of irritation, blurred vision, itchiness, and other eye discomforts. No evidence exists to suggest that any of these symptoms lead to long-term or permanent side effects. Good judgment can prevent even temporary side effects.

Eye strain increases with the amount of time spent at the computer. Changing tasks and avoiding

unnecessarily long and sustained periods of concentration at the computer screen can reduce eye discomfort. Users should interrupt work at the VDT by periodic breaks. The National Institute of Occupational Safety and Health (NIOSH) recommends a rest break after 2 hours of continuous VDT work at least and more frequent breaks if the material is visually and mentally demanding.

Proper workroom conditions, such as appropriate lighting and the arrangement of work space, is important. For example, positioning the computer at a 90-degree angle to a window and adjusting the screen to reduce the reflections help to eliminate harsh and uncomfortable glare. Subdue direct sunlight by adjusting drapes or blinds. In cases where direct sunlight is not a problem (such as in an interior office), place computers so glare from overhead lights does not reflect from the screens. If these options are unavailable, consider using a glare shield.

Neck and Shoulder Discomfort

Workstation design plays an important role in reducing physical or musculoskeletal discomfort (neck and shoulder pain). Correct posture and, especially, adequate wrist and back support is essential to avoid musculature discomfort. On the other hand, "correct" posture varies depending on individual build, weight, and preferences. Good workstation design allows for such differences through the use of adjustable furniture. The illustration on page 7 gives several recommendations that individuals who spend long periods at the computer should consider.

Carpel tunnel syndrome (CTS) is one problem that has received considerable attention. Although not fully understood, CTS seems to be related to repetitive motion and flexing of the wrist. The condition is aggravated when the hand is improperly positioned, placing stress on the median nerve and tendon of the wrist. The symptoms of CTS may go

undetected but if left unattended can lead to problems. Warning signs of CTS include

- tingling of the fingers,
- loss of hand strength, and
- arm and shoulder pain.

As with other discomforts discussed earlier, users can avoid CTS through good workstation design, which ensures that hands and wrists are properly positioned at and paralleled with the computer keyboard.

Commonly Asked Questions

1. What health risks are associated with the computer?

The health risks appear to be similar to those involved in traditional office work, although using the computer can aggravate the symptoms and discomfort.

2. What type of discomfort can result from computer work?

Discomfort does not always occur, especially when preventive steps are taken. The most frequently reported problems are tired, irritated eyes and neck and shoulder pain.

3. What are the risks for pregnant women?

The most recent study suggests that radiation emitted by computers is extremely low and presents no hazard for pregnant women.

4. Can the eyes be permanently affected by extensive work on VDTs?

Although long-term research is needed, no indications exist that computer work causes disease or damage to the eyes. The discomfort reported

appears to be temporary. Persistent problems should not be ignored.

5. Can work with computers cause permanent musculoskeletal problems?

Some concern exists about a possible link between repetitive hand motion and carpel tunnel syndrome. Good ergonomic workstation design reduces—if not altogether prevents—this, as well as muscular problems due to poor posture.

Exercising Can Alleviate or Prevent Discomfort

You can help relax tense muscles at your workstation by doing the following exercises. If pain or stress persist, consider contacting a medical specialist.

Eyes

1. Cup your hands lightly over closed eyes for 1 minute.

2. Look into the distance from time to time—at something at least 20 feet away.

Head and Neck

1. Slowly turn the head left, hold 3 seconds; turn the head right, hold 3 seconds.

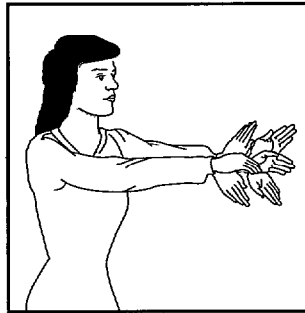2. Drop chin gently to the chest, then tilt head back as far as you can.

3. Repeat the sequence 5 to 10 times.

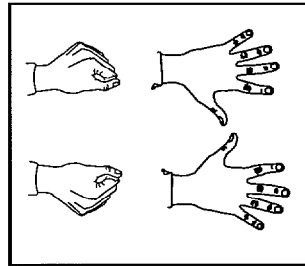| Shoulders | 1. Roll the shoulders forward 5 times, then backward 5 times, using a circular motion. |

Wrists	1. Extend arms in front of you.
	2. Raise and lower hands several times.
	3. Rotate hands 10 times.

| Hands and Fingers | 1. Make a fist and hold tight for 1 second. |
| | 2. With palm down, spread fingers wide for 5 seconds. |

For Additional Information

For additional information, readers may contact the National Institute for Occupational Safety and Health (NIOSH) at the following toll-free telephone number:
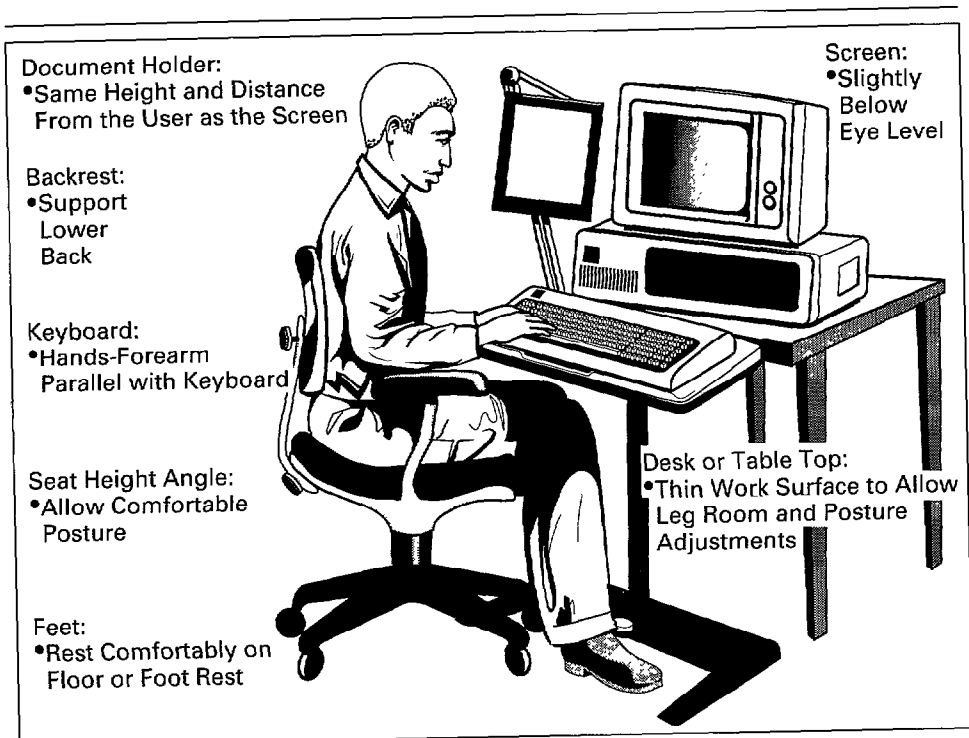
1-800-35-NIOSH

Suggested References

NIOSH Publications on Video Display Terminals. U.S. Department of Health and Human Services, Washington, DC: 1988.

Schnorr, Teresa M. "The NIOSH Study of Reproductive Outcomes Among Video Display Terminal Operators." Reproductive Toxicology, Vol. 4 (1990), pp. 61-65.

Visual Display Terminals and Workers' Health. World Health Organization, Publication No. 99, Geneva, Switzerland: 1987.

Working Safely with Video Display Terminals. U.S. Department of Labor, OSHA 3092, Washington, DC: 1986.

Document Holder:
•Same Height and Distance
 From the User as the Screen

Backrest:
•Support
 Lower
 Back

Keyboard:
•Hands-Forearm
 Parallel with Keyboard

Seat Height Angle:
•Allow Comfortable
 Posture

Feet:
•Rest Comfortably on
 Floor or Foot Rest

Screen:
•Slightly
 Below
 Eye Level

Desk or Table Top:
•Thin Work Surface to Allow
 Leg Room and Posture
 Adjustments

Acknowledgments

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